What is Claimed is:

1. A grid-connected power system having a back-up power source, comprising

a DC/AC inverter providing an alternating current output compatible with the alternating current of a utility grid, said DC/AC inverter being electrically connected with the utility grid to supply said output to the utility grid when power from the utility grid is available to power a load, being disconnected from the utility grid when power from the utility grid is unavailable to power the load, and being electrically connected with a selected portion of the load to supply said output to the selected portion of the load when power from the utility grid is unavailable to power the load;

a primary power source providing a direct current output having a first voltage supplied as input to said DC/AC inverter;

a back-up power source providing a direct current output having a second voltage, different than said first voltage; and

a DC/DC converter for receiving said output of said back-up power source when said DC/AC inverter is electrically connected with the selected portion of the load, said DC/DC converter converting the voltage of said output of said back-up power source from said second voltage to said first voltage to provide a direct current output having said first voltage supplied from said DC/DC converter to said DC/AC inverter as needed to power the selected portion of the load

2. The grid-connected power system recited in claim 1 wherein said first voltage is greater than said second voltage.

3. The grid-connected power system recited in claim 2 wherein said first voltage is in the range of 200 to 600VDC nominal and said second voltage is 96VDC nominal.

4. The grid-connected power system recited in claim 1 wherein said primary power source comprises a photovoltaic (PV) array.

5. The grid-connected power system recited in claim 1 wherein said back-up power source comprises a battery.

6. The grid-connected power system recited in claim 5 wherein said primary power source comprises a photovoltaic (PV) array.

7. The grid-connected power system recited in claim 1 and further comprising a transfer unit electrically connecting said DC/AC inverter with the utility grid when power from the utility grid is available to power the load, automatically disconnecting said DC/AC inverter from the utility grid when power from the utility grid is unavailable to power the load, and automatically connecting said DC/AC inverter with the selected portion of the load when power from the utility grid is unavailable to power the load.

8. The grid-connected power system recited in claim 1 wherein said back-up power source is powered by said primary power source.

9. The grid-connected power system recited in claim 1 wherein said back-up power source is powered by the utility grid.

10. The grid-connected power system recited in claim 1 wherein said back-up power source and said DC/DC converter form an add-on module.

11. A grid-connected power system having a back-up power source, comprising

a DC/AC inverter providing an alternating current output compatible with the alternating current of a utility grid, said DC/AC inverter being electrically connected with the utility grid to supply said output to the utility grid when power from the utility grid is available to power a load, being disconnected from the utility grid when power from the utility grid is unavailable to power the load, and being electrically connected with a selected portion of the load to supply said output to the selected portion of the load when power from the utility grid is unavailable to power the load;

a primary power source providing a direct current output supplied to said DC/AC inverter;

a back-up power source charged by said primary power source, said back-up power source providing a direct current output supplied to said DC/AC inverter as needed to power the selected portion of the load when said DC/AC inverter is electrically connected with the selected portion of the load; and

a DC/DC converter through which an as needed portion of said output of said primary power source is supplied to said back-up power source only as needed to charge said back-up power source.

12. The grid-connected power system recited in claim 11 wherein said output of said primary power source has a first voltage, said output of said back-up power source has a second voltage, different than said first voltage, said output of said back-up power source is supplied to said DC/AC inverter through said DC/DC converter, said DC/DC converter converting the voltage of said output of said primary power source through said DC/DC converter from said first voltage to said second voltage and converting the voltage of said output of said back-up power source through said DC/DC converter from said second voltage to said first voltage.

13. The grid-connected power system recited in claim 12 wherein said second voltage is less than said first voltage, said DC/DC converter decreases the voltage of said output of said primary power source from said first voltage to said second voltage and increases the voltage of said output of said back-up power source from said second voltage to said first voltage.

14. The grid-connected power system recited in claim 13 wherein said primary power source comprises a photovoltaic (PV) array.

15. The grid-connected power system recited in claim 13 wherein said back-up power source comprises a battery.

16. The grid-connected power system recited in claim 15 wherein said primary power source comprises a photovoltaic (PV) array.

17. A grid-connected power system having a back-up power source, comprising

a DC/AC inverter providing an alternating current output compatible with the alternating current of a utility grid, said DC/AC inverter being electrically connected with the utility grid to supply said output to the utility grid when power from the utility grid is available to power a load, being disconnected from the utility grid when power from the utility grid is unavailable to power the load, and being electrically connected with a selected portion of the load when power from the utility grid is unavailable to power the load;

a primary power source providing a direct current output supplied to said DC/AC inverter;

a back-up power source charged by the utility grid when power from the utility grid is available to power the load, said back-up power source providing a direct current output supplied to said DC/AC inverter when said DC/AC inverter is electrically connected with the selected portion of the load; and

an AC/DC converter through which alternating current from the utility grid is supplied to said back-up power source as needed to charge said back-up power source, said AC/DC converter converting the alternating current of the utility grid into direct current of appropriate voltage to charge said back-up power source.

18. The grid-connected power system recited in claim 17 wherein said AC/DC converter decreases the voltage of alternating current therethrough from the utility grid.

19. The grid-connected power system recited in claim 17 wherein said primary

power source provides a direct current output having a first voltage, said back-up power source provides a direct current output having a second voltage, different than said first voltage, and further including a DC/DC converter through which said output of said back-up power source is supplied to said DC/AC inverter, said DC/DC converter converting the voltage of said output of said back-up power source through said DC/DC converter from said second voltage to said first voltage.

20. The grid-connected power system recited in claim 19 wherein said AC/DC converter decreases the voltage of alternating current therethrough from the utility grid to said second voltage.

21. The grid-connected power system recited in claim 20 wherein said AC/DC converter decreases the voltage of alternating current therethrough from the utility grid from 120/240VAC nominal to 96VDC nominal, said DC/DC converter increases the voltage of said output of said back-up power source from 96VDC nominal to 200 to 600VDC nominal, and said output of said primary power source has a voltage of 200 to 600VDC nominal.

22. The grid-connected power system recited in claim 20 wherein said primary power source comprises a photovoltaic (PV) array.

23. The grid-connected power system recited in claim 20 wherein said back-up power source comprises a battery.

24. The grid-connected power system recited in claim 23 wherein said primary power source comprises a photovoltaic (PV) array.

25. The grid-connected power system recited in claim 17 wherein said DC/AC inverter supplies said alternating current output to said AC/DC converter as needed to charge said back-up power source when power from the utility grid is unavailable to power the load, said AC/DC converter converting said alternating current output of said DC/AC inverter into direct current of appropriate voltage to charge said back-up power source.

26. The grid-connected power system recited in claim 20 wherein said DC/AC inverter supplies said alternating current output to said AC/DC converter as needed to charge said back-up power source when power from the utility grid is unavailable to power the load, said AC/DC converter decreasing the voltage of alternating current therethrough from said DC/AC inverter to said second voltage.

27. The grid-connected power system recited in claim 26 wherein said AC/DC converter decreases the voltage of alternating current therethrough from the utility grid from 120/240 VAC nominal to 96 VDC nominal, said AC/DC converter decreases the voltage of said alternating current output of said DC/AC inverter from 120 VAC nominal to 96 VDC nominal, said DC/DC converter increases the voltage of said output of said back-up power source from 96 VDC nominal to 200 to 600 VDC nominal, and said output of said primary power source has a voltage of 200 to 600 VDC nominal.

28. A method of providing back-up power in a grid-connected power system, comprising the steps of

providing a direct current output having a first voltage from a primary power source;

converting the direct current output of the primary power source into alternating current derived from the primary power source;

supplying the alternating current derived from the primary power source to a utility grid when power from the utility grid is available to power an AC load;

providing a direct current output having a second voltage, different than the first voltage, from a back-up power source;

converting the voltage of the direct current output of the back-up power source from the second voltage to the first voltage to obtain a direct current of converted voltage;

converting the direct current of converted voltage into alternating current derived from the back-up power source; and

supplying the alternating current derived from the back-up power source to a selected portion of the load when power from the utility grid is unavailable to power the load.

29. The method recited in claim 28 and further including the step of supplying the alternating current derived from the primary power source to the selected portion of the load simultaneously with said step of supplying the alternating current derived from the back-up power source to the selected portion of the load.

30. The method recited in claim 28 wherein said step of converting the direct current output of the primary power source comprises supplying the direct current output of the primary power source through a DC/AC inverter, said step of converting the voltage of the direct current output of the back-up power source includes supplying the direct current output of the back-up power source through a DC/DC converter and said step of converting the direct current of converted voltage comprises supplying the direct current of converted voltage through the DC/AC inverter.

31. The method recited in claim 30 and further including the steps of supplying the direct current output of the primary power source through the DC/DC converter as needed to charge the back-up power source and converting the voltage of the direct current output of the primary power source through the DC/DC converter from the first voltage to the second voltage.

32. The method recited in claim 31 wherein said step of converting the voltage of the direct current output of the back-up power source comprises increasing the voltage of the direct current output of the back-up power source from the second voltage to the first voltage and said step of converting the voltage of the direct current output of the primary power source includes decreasing the voltage of the direct current output of the primary power source from the first voltage to the second voltage.

33. The method recited in claim 32 wherein said step of providing a direct current output having a first voltage comprises providing the direct current having the first voltage from a photovoltaic (PV) array and said step of providing a direct current

output having a second voltage comprises supplying the direct current having the second voltage from a battery.

34 The method recited in claim 28 and further including the steps of converting alternating current of the utility grid into direct current of appropriate voltage for the back-up power source and supplying the direct current of appropriate voltage to the back-up power source as needed to charge the back-up power source when power from the utility grid is available to power the load.

35. The method recited in claim 34 wherein said step of converting alternating current of the utility grid comprises supplying the alternating current of the utility grid through an AC/DC converter and decreasing the voltage of the current through the AC/DC converter to the second voltage.

36. The method recited in claim 35 and further including the steps of converting the alternating current derived from the primary power source into direct current of appropriate voltage for the back-up power source and supplying the direct current of appropriate voltage derived from the primary power source to the back- up power source as needed to charge the back-up power source when power from the utility grid is unavailable to power the load.

37. The method recited in claim 36 wherein said step of converting alternating current derived from the primary power source comprises supplying the alternating current derived from the primary power source through the AC/DC converter and

decreasing the voltage of the current through the AC/DC converter to the second voltage.

38. The method recited in claim 37 wherein said step of providing a direct current output having a first voltage comprises providing the direct current output having the first voltage from a photovoltaic (PV) array and said step of providing a direct current output having a second voltage comprises providing the direct current output having the second voltage from a battery.

39. The method recited in claim 28 and further including the steps of converting the alternating current derived from the primary power source into direct current of appropriate voltage for the back-up power source and supplying the direct current of appropriate voltage to the back-up power source as needed to charge the back-up power source when power from the utility grid is unavailable to power the load.

40. The method recited in claim 39 wherein said step of converting the alternating current derived from the primary power source comprises supplying the alternating current derived from the primary power source through an AC/DC converter and decreasing the voltage of the current through the AC/DC converter to the second voltage.

41. The method recited in claim 30 and further including the steps of electrically connecting the DC/AC inverter to the utility grid when power from the utility grid is available to power the load, disconnecting the DC/AC inverter from the utility grid

when power from the utility grid is unavailable to power the load, and electrically connecting the DC/AC inverter to the selected portion of the load when power from the utility grid is unavailable to power the load.